

Application No. 10/629,806
Response dated September 2, 2004
Reply to Office Action of June 3, 2004

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claim 1 (original): A resist pattern thickening material comprising:

a resin;
a crosslinking agent; and
a nitrogen-containing compound.

Claim 2 (original): A resist pattern thickening material according to Claim 1, wherein the nitrogen-containing compound is a basic compound.

Claim 3 (original): A resist pattern thickening material according to Claim 1, wherein the nitrogen-containing compound is one of amine, amide, imide, quaternary ammonium, and a derivative thereof.

Claim 4 (original): A resist pattern thickening material according to Claim 1, wherein the

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resist pattern thickening material exhibit at least one of water-solubility and alkali-solubility.

Claim 5 (original): A resist pattern thickening material according to Claim 1, further comprising a surfactant.

Claim 6 (original): A resist pattern thickening material according to Claim 5, wherein the surfactant is a non-ionic surfactant.

Claim 7 (original): A resist pattern thickening material according to Claim 6, wherein the non-ionic surfactant is at least one of a polyoxyethylene - polyoxypropylene condensation product, a polyoxyalkylene alkylether compound, a polyoxyethylene alkylether compound, a polyoxyethylene derivative, a sorbitan fatty acid ester compound, a glycerin fatty acid ester compound, a primary alcohol ethoxylate compound, a phenol ethoxylate compound, an alkoxylate surfactant, a fatty acid ester surfactant, an amide surfactant, an alcohol surfactant, and an ethylene diamine surfactant.

Claim 8 (original): A resist pattern thickening material according to Claim 1, wherein the resin is at least one of polyvinyl alcohol, polyvinyl acetal, and polyvinyl acetate.

Claim 9 (original): A resist pattern thickening material according to Claim 1, wherein the

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crosslinking agent is at least one of a melamine derivative, a urea derivative, and an uril derivative.

Claim 10 (original): A resist pattern thickening material according to Claim 1, further comprising a water-soluble aromatic compound.

Claim 11 (original): A resist pattern thickening material according to Claim 10, wherein the water-soluble aromatic compound is at least one of a polyphenol compound, an aromatic carboxylic acid compound, a naphthalene polyhydroxyl compound, a benzophenone compound, a flavonoid compound, a derivative thereof, and a glycoside thereof.

Claim 12 (original): A resist pattern thickening material according to Claim 1, further comprising a resin containing an aromatic compound in a portion thereof.

Claim 13 (original): A resist pattern thickening material according to Claim 12, wherein the resin containing an aromatic compound in a portion thereof is at least one of a polyvinyl aryl acetal resin, a polyvinyl aryl ether resin, and a polyvinyl aryl ester resin.

Claim 14 (original): A resist pattern thickening material according to Claim 1, further comprising an organic solvent.

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Claim 15 (original): A resist pattern thickening material according to Claim 14, wherein the organic solvent is at least one of an alcohol solvent, a chain ester solvent, a cyclic ester solvent, a ketone solvent, a chain ether solvent, and a cyclic ether solvent.

Claim 16 (currently amended): A resist pattern comprising:
an inner layer of a resist pattern; and
a surface layer of a resist pattern provided on the inner layer, the surface layer being a thickening material to cover a surface of a resist pattern to be thickened so as to thicken the resist pattern to be thickened,
~~wherein the resist pattern thickening material is applied onto the resist pattern to be thickened after forming the resist pattern to be thickened,~~
~~wherein the resist pattern thickening material comprising comprises:~~
a resin;
a crosslinking agent; and
a nitrogen-containing compound.

Claim 17 (original): A process for forming a resist pattern, comprising:
applying a resist pattern thickening material onto a resist pattern to be thickened after forming the resist pattern to be thickened so as to cover a surface of the resist pattern to be thickened,

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wherein the resist pattern thickening material comprises:

- a resin;
- a crosslinking agent; and
- a nitrogen-containing compound.

Claim 18 (original): A process for forming a resist pattern according to Claim 17, wherein a material of the resist pattern to be thickened is at least one of a novolak resist, a polyhydroxystyrene (PHS) resist, an acrylic resist, a cycloolefin - maleic acid anhydride resist, a cycloolefin resist, and a cycloolefin - acryl hybrid resist.

Claim 19 (original): A process for forming a resist pattern according to Claim 17, further comprising:

developing the resist pattern thickening material, after applying the resist pattern thickening material.

Claim 20 (original): A semiconductor device comprising:

a pattern formed by using a resist pattern thickened by using a resist pattern thickening material,

wherein the resist pattern thickening material comprises:

- a resin;

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a crosslinking agent; and
a nitrogen-containing compound.

Claim 21 (original): A process for manufacturing a semiconductor device comprising:
applying a resist pattern thickening material onto a resist pattern to be thickened, after the resist pattern to be thickened is formed, so as to thicken the resist pattern to be thickened and form the resist pattern; and
patterning the underlying layer by etching using the resist pattern as a mask so as to pattern the underlying layer,
wherein the resist pattern thickening material comprises:
a resin;
a crosslinking agent; and
a nitrogen-containing compound.